INDH-6701 Digital Frequency Converter User Manual

V2.6

INITEL TELECOMMUNICATIONS

Chapter 1 Product Introduction

1.1 Description

The function of **INDH-6701** Digital Frequency Converter is to convert DVB RF signal of one channel into another channel, and it dispenses with the aftertreatment of decompressing, encoding and multiplexing to the digital signal. It can be widely applied to satellite digital TV, digital broadcast, CATV network and so on.

1.2 Feature

◆The function of this product is to convert RF signal of one channel into another channel;

◆This product can uplink-convert medium frequency into radio frequency, conversely it can;

◆downlink-convert radio frequency into medium frequency, besides it also can convert frequencies;

◆between RFs or peer frequencies;

◆This product is suitable for digital signal processing as well as analogue signal processing;

◆LCD real-timely displays various performance indexes;

◆Having RF automatically gain control (AGC), making front-end system working more reliably and stably;

◆Micro-processing unit controls input/output signal levels;

◆Adjacent frequency design, medium frequency processing, surface audio wave filter (SAW), good interference suppressing;

◆Local oscillation adopts unique phase-locked loop, low phase noise, low phase jitter, low error rate, especially suitable for digital signal frequency conversion;

◆Down-link frequency conversion and up-link frequency conversion adopt excellent qualified dual-balanced frequency mixer, good linearity, low distortion;

◆low clutter interference;

◆RF and medium frequency system circuits adopt multi-channel filters, which reduce outside signal interference against local machine;

◆RF output circuit adopts international brand amplifying module, which guarantees output dynamic and parasite suppression;

◆19 standard structure, independent power supply, elegant exterior, flexible corollary equipment.

Application Range

◆ Satellite digital TV broadcast

◆ MMDS digital TV head-end

◆ Digital CATV network

RF Input Frenquency	30-862MHz (central frequency of an optional aptotic channel)
RF Input Mode	QAM、QPSK、CMTS (user must indicate a certain one in three modes)
RF Input Level	95dBμv
RF Input Level Range	85-105dBμv
RF Input Impedance	75Ω
Input AGC Range	±10dB/±1dB
Input Return Loss	≥12dB
RF Output Frequency	110-862MHz (central frequency of an optional aptotic channel)
IF Input and Output Frequency	35-44MHz （125KHz Stepping）
Maximum Output Level	≥115 dBμv
Output Inspection	-20 dBc
Adjusting Range of Output Level	0-20 dB(0.5dB Stepping)
Output Impedance	75Ω
Output Return Loss	≥12dB
Phase Noise	≥96 dBc@10KHz(30-300MHz) ≥94 dBc@10KHz(300-550MHz) ≥92 dBc@10KHz(550-860MHz)
Frequency Conversion Precision	≤5 KHz
Spurious Output Rejection	≥55dB（The distance of 2 contiguous

User order guide:
It is necessary to indicate the mode of RF input.
A=QAM/CMTS
B=QPSK;

And conversion style.
C=RF to IF
D=IF to RF
E=RF to RF

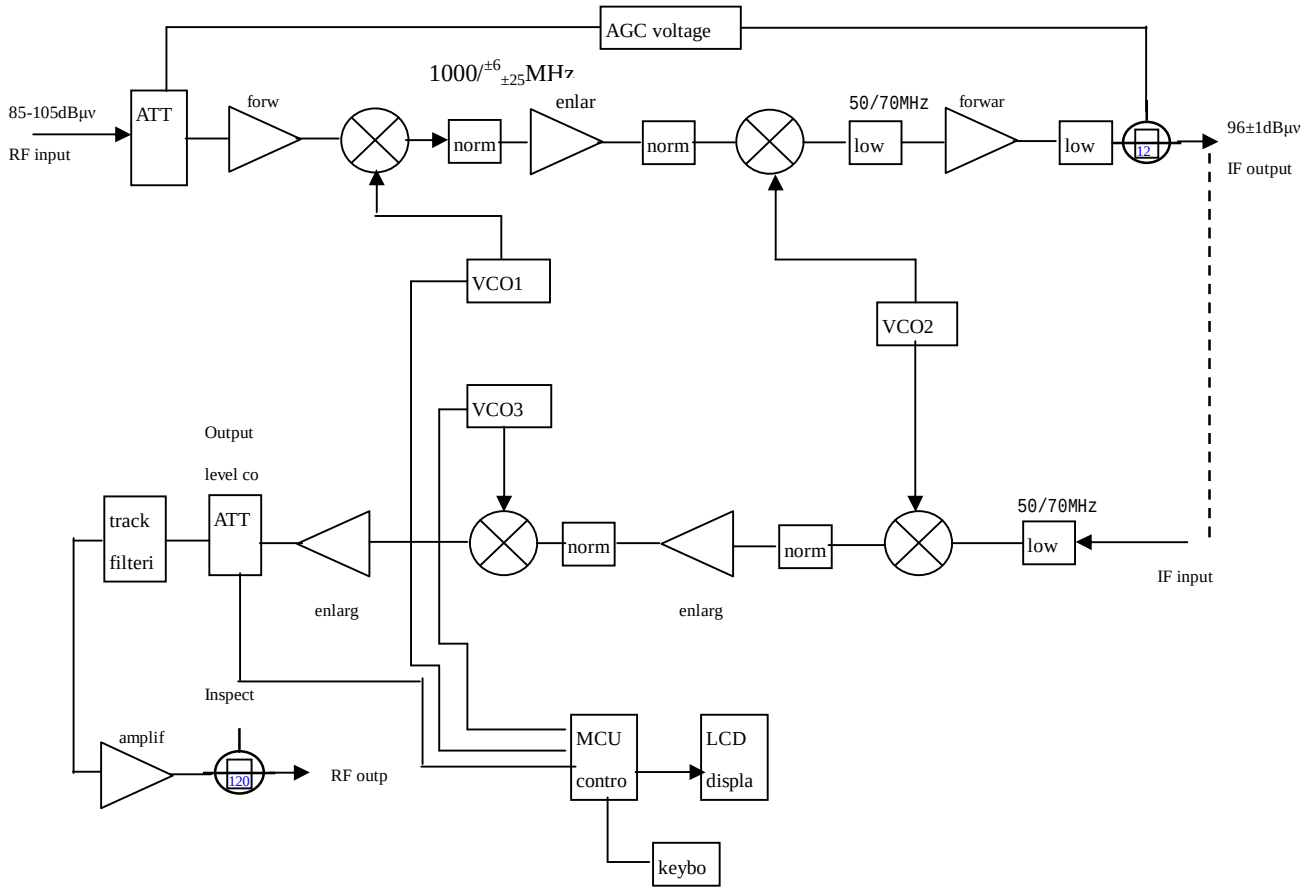
For example:
JNDH-6701-AE means RF input mode is QAM/CMTS and conversion style is RF to RF.

		frequency points＞20MHz）	
Audio In-Band Flatness		±0.5dB	
General Specification	Size	44mm×482mm×330mm	
	Condition	0-45(Work)；20-80（Storage）	
	Power Supply	AC220V±10% 50Hz 20VA	

1.4 System Component and work element

1.4.1 System Component

INDH-6701 Digital Frequency Converter system component as following：



1.4.2 Work Elements

1.4.2.1 Down-Converter

The signal is input from RF interface, frequency range is 30—862MHz.It is converted to IF signal by digital frequency converter.

1.4.2.2 Up-Converter

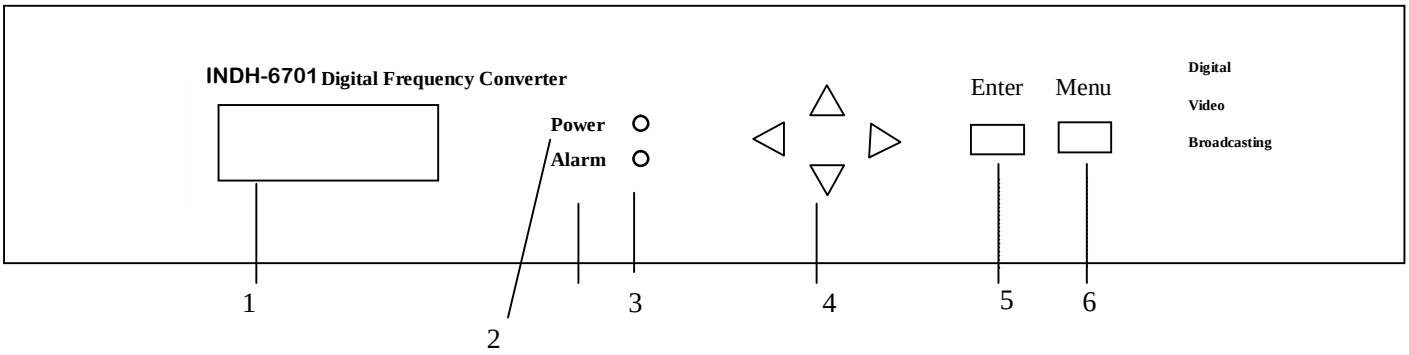
Input local IF signal or outside IF into digital frequency converter, it will output standard RF signal of required frequency.

It can do parameter setting of **INDH-6701** Digital Frequency Converter to operate the buttons on panel and view LCD.

On the panel, there is a warning indicator light of input signal level in order to inspect the input level range. If the level is lower than 85dBμV or higher than 105dBμV, the indicator light will turn bright.

1.5 Panel Sketch Picture

1.5.1 Front Panel Sketch Picture



"1": LCD ; "2": Power Indicator Light; "3": Warning Indicator Light (Inspect the input level range, If the level is lower than 85dBμV or higher than 105dBμV, the warning indicator light will turn bright); "4": Direction Button;"5": Confirm/Unlock Button;"6":"7": Menu Button.

1.5.2 Rear Panel Sketch Picture

From left to right: 1、RF Input Port: F interface

2、IF Input Port: F interface

3、IF Onput Port: F interface

4、RF Onput Port：F interface

5、Test Port of RF Output: F interface

6、Power Supply Switch and Electrical Outlet

7、Device Earthing Pole

Chapter 2 Installation Guide

1.1 Acquisition Check

When users open the package of the device, it is necessary to check items according to packing list. Normally it should include the following items:

- **INDH-6701** Digital Frequency Converter 1
- User's Manual 1
- AC Input Power Cord 1

If any item is missing or mismatch with the list above, please contact local dealer.

1.2 Installation Preparation

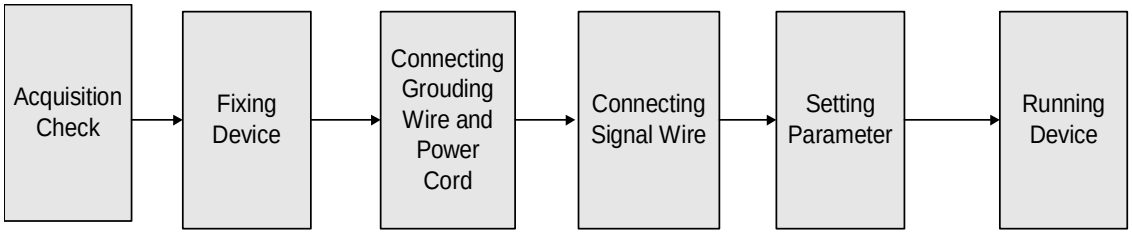
When users install device, please follow the below steps. The details of installation will be described at the rest part of this chapter. Users can also refer rear panel chart during the installation.

The main content of this chapter including:

- Checking the possible device missing or damage during the transportation
- Preparing relevant environment for installation
- Installing **INDH-6701** Digital Frequency Converter

■ Connecting signal wires

1.2.1 Device's Installation Flow Chart Illustrated as following:



1.2.2 Environment Requirement

Item	Requirement
Machine hall space	When user install machine frame array in one machine hall, the distance between 2 row of machine frames should be 1.2~1.5m and the distance to wall should be no less than 0.8m。
Machine hall floor	Electric Isolation, Dust Free Volume resistivity of ground anti-static material:1×10^{7}~$1\times10^{10}\Omega$, Grounding current limiting resistance: 1MΩ。 Floor bearing should be greater than 450Kg/m2。
Environment temperature	5~40℃ sustainable , 0~45℃ short time, installing air-conditioning is recommended
Relative temperature	20%~80% sustainable 10%~90% short time
Pressure	86~105KPa。
Door & window	Installing rubber strip for sealing door-gaps and dual level glasses for window
Wall	It can be covered with wallpaper, or brightness less paint.
Fire protection	Fire alarm system and extinguisher
Power	Requiring device power, air-conditioning power and

	lighting power are independent to each other. Device power requires AC power 220V 50Hz. Please carefully check before running.

1.2.3 Grounding Requirement

- All function modules' good grounding designs are the base of reliability and stability of device. Also, they are the most important guarantee of lightning arresting and interference rejection. Therefore, system must follow this rule.
- Coaxial cable's outer conductor and isolation layer should keep sound electric conducting with the metal housing of device.
- Grounding conductor must adopt copper conductor in order to reduce high frequency impedance, and the grounding wire must be as thick and short as possible.
- The 2 terminals of grounding wire must make sure for well electric conducting, and process for antirust.
- It is prohibited that users use other devices as part of grounding wire's electric circuit
- The section of the conjunction between grounding wire and device's frame should be equal or greater than 25mm2

1.2.4 Frame Grounding

All the machine frames should connect to protective copper strip. The grounding wire should be as short as possible and avoid circling. The section of the conjunction between grounding wire and grounding strip should be equal or greater than 25mm2。

1.2.5 Device Grounding

Connecting the device's grounding rod to frame's grounding strip with copper wire.

1.3 Power Cord Connection

The power supply outlet is located at the left of rear panel, and the power switch is just above it. The protective grounding wire connective screw is located at the down-left side of power supply outlet

- Connecting Power Cord

  User can insert one end into power supply outlet, while insert the other end to AC power.

- Connecting Grounding Wire

  When the device solely connects to protective ground, it should adopt independent way, say, share the same ground with other devices. When the device adopts united way, the grounding resistance should be smaller than 1Ω

☞**Caution:**

Before connecting power cord to INDH-6701 Digital Frequency Converter, user should set the power switch to "OFF".

1.4 Signal Wire Connection

The signal connection includes the connection of input signal wire and the connection of output signal wire. The input signal wire should be connected to RF IN of **INDH-6701**L Digital Frequency Converter. IF input and IF output should be connected by the cable with 2 F plugs on 2 ends. RF output signal wire should be also connected to the cable with F plug.

2 Function Introduction of Front Panel

2.1 Function of Buttons

Left and Right Button: Move Cursor;

Up and Down Button: Set Parameters;

Enter Button： Unlock, save modification and select function.;

Menu Button：Return to main menu, check parameters, modify parameter or quit.

Attention: Please press the Enter button after set new parameters. If there is a "*" mark before a certain parameter, it means this parameter is available. If not, it means the original parameter is kept and you can re-set parameter.

2.2 Startup

After startup, display the following content：

System Initializing Please Wait

Then the following content：

INDH-6701 DSC RF Input：xxx.000MHz

Power indicator light turn bright, enter work condition。

2.3 Set Parameters

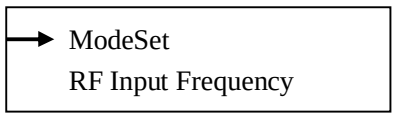
2.3.1 Main Menu Structure：

Press Enter button, LCD turn bright, press "Down" button in succession, display the following menus in turn:

→ ModeSet RF Input Frequency
→ IF Frequency RF Output Frequency
→ RF Level ATT Select Language
→ Factory Setting View Serial Number
→ About DSC System

2.3.2 Operation Explanation

（1） Mode Set：In the standby mode, press “Menu” button or “Enter” button, display the following content:



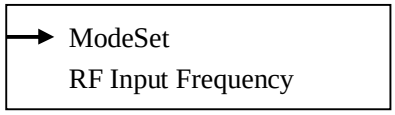
Cursor “→” points at “ModeSet”, press “Enter” button, display the following content:

Press “Left” or “Right” button, let “*” mark points at the mode as requirement, and press “Enter” button, display the following content:

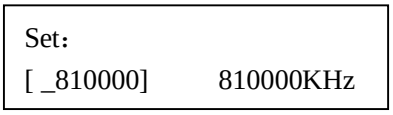
When display the following content：

It means the setting is successful. Please enter the next parameter setting.

（2）RF Input Frequency：In the standby mode, press “Menu” button or “Enter” button, display the following content:



Cursor points at “ModeSet”, press “Down” button to move it at “RF Input Frequency”, press “Enter” button, display the following content:

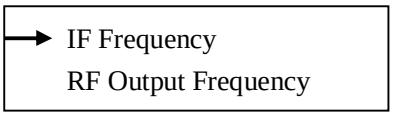


Press “Left” or “Right” button, let the cursor point at the number which should be set, press “Up” or “Down” buttons to set it, press “Enter” and display the following content:

When display the following content:

It means the setting is successful. Please enter the next parameter setting.

（3） IF Frequency: In the standby mode, press “Menu” button or “Enter” button, press “Down” button in succession, display the following content:



Press “Enter” button, display the following content:

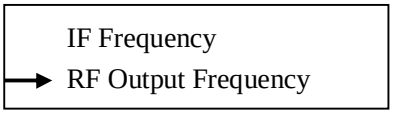
Press “Left” or “Right” button, let the cursor point at the number which should be set, press “Up” or “Down” button to set it, press “Enter” and display the following content:

When display the following content:

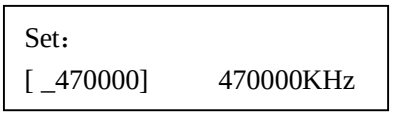
It means the setting is successful. Please enter the next parameter setting.

（4）RF Output Frequency: In the standby mode, press “Menu” button

or “Enter” button, press “Down” button in succession, display the following content:



Press “Enter” button, display the following content:

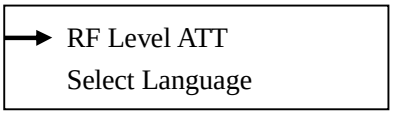


Press “Left” or “Right” button, let the cursor point at the number which should be set, press “Up” or “Down” button to set it, press “Enter” and display the following content:

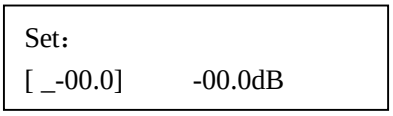
When display the following content:

It means the setting is successful. Please enter the next parameter setting.

（5） RF Level ATT: In the standby mode, press “Menu” button or “Enter” button, press “Down” button in succession, display the following content:



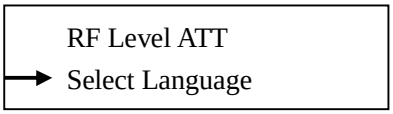
Press “Enter” button, display the following content:



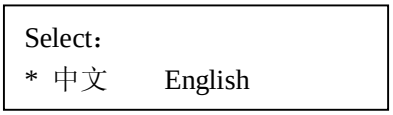
Press “Left” or “Right” button, let the cursor point at the number which should be set, press “Up” or “Down” button to set it, press “Enter” and display the following content:

When display the following content：

It means the setting is successful. Please enter the next parameter setting.（6） Select Language：In the standby mode, press “Menu” button or “Enter” button, press “Down” button in succession, display the following content:



Press “Enter” button, display the following content:

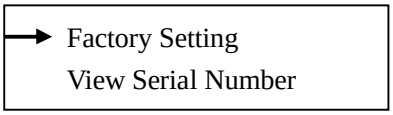


Press “Left” or “Right” button, let “*” mark point at the language which should be set, press “Enter”, display the following content:

When display the following content：

It means the setting is successful. Please enter the next parameter setting.

（7） Factory Setting：In the standby mode, press “Menu” button or “Enter” button, press “Down” button in succession, display the following content:



Press “Enter” button, display the following content:

Press "Left" or "Right" button, let "*" mark point at the alternative option, press "Enter", display the following content:

Select: Saving

When display the following content:

Select:	
Saving	Done

It means the setting is successful.

2.4 System Error and Solution

2.4.1 Condition of Indicator Light

There are 2 LED indicator lights on the panel as following:

(1)"Power" is power indicator light. Turn on power supply, the light turn bright, it means power supply works well.

(2)"Alarm" is warning indicator light. It is out when system works well.

3.2 General Malfunction Solution

(1) Power indicator light is out

Please check if the power cord is inserted electrical outlet or not and if power supply turn on or not.

(2) Warning indicator light turn bright

It means no RF signal input or RF signal input level is not in the level range. Please readjust RF input level to the middle point of AGC control level.